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LINARITE AND LEADHILLITE FROM IDAHO

EARL V. SHANNON

Washington, D. C.

The specimens described below were found included in a miscellaneous collection of minerals made by the writer in the Caledonia Mine, near Wardner, Idaho in 1910. They came from some of the stopes above the 150 meter level and were supposed when collected to be azurite and were labeled as such. No particular attention was paid to the specimens at the time, as azurite was common about the mine, and it was not until after this portion of the mine was worked out and abandoned that the specimens received any more minute examination. The first specimen consists of a rosette of flat-bladed blue crystals about a centimeter in diameter implanted upon a joint in a mass made up of quartzite fragments cemented by cerussite and covellite. The crystals are somewhat brighter in color and more adamantine in luster than azurite. This showy rosette first attracted attention to the specimen and the mineral was found upon examination to have the blowpipe characteristics of linarite.

This discovery led to a more detailed examination of specimens of supposed azurite from this mine. Of nine additional specimens thus examined eight were azurite and the ninth consisted of massive cerussite colored dark by included unoxidized galena, encrusted by linarite, limonite and a mineral subsequently found to be leadhillite. The linarite is implanted both upon the cerussite and the limonite in the form of minute prismatic crystals of fine deep blue color and adamantine luster. Examined under the microscope they are seen to be flat prisms elongated on the *b* axis and flattened parallel to the basal pinacoid, giving parallel extinction between crossed nicols, which at first suggests orthorhombic symmetry. They are transparent, bright blue by transmitted light and non-pleochroic. The crystals are too small to permit the planes forming the termina-

tion to be identified. Approximate measurement of the angles in the zone perpendicular to the elongation determined the forms to be $a(100)$, $c(001)$, and $s(\bar{1}01)$. If we may assume that, since 20 per cent. of the material collected as azurite turned out to be linarite, one fifth of all blue minerals in the deposit was linarite, it must have been present in considerable amount, as blue minerals were of widespread and abundant occurrence in the oxidized lead-copper ores of this mine.

Attention was next directed to some greenish to brownish white grains or masses on the second specimen. This mineral, which is dull and appears as tho somewhat etched and altered in its outward portion, might readily be mistaken for cerussite except that when broken open the grains show a very perfect cleavage in one direction with pearly luster on the cleavage face. Before the blowpipe on charcoal with sodium carbonate this mineral gives a lead oxide coating and a button of metallic lead. In the closed tube it turns first red and then yellow and decrepitates, yielding a small amount of water. It is soluble in hot hydrochloric acid with evolution of carbon dioxide and the resulting solution reacts for sulfate with barium chloride. The very perfect basal cleavage makes it an easy matter to obtain thin oriented plates of the mineral by simply crushing a fragment gently on a glass slide. Small scales thus obtained when embedded in balsam and examined under the microscope were found to be transparent and colorless. They laid upon a face of the perfect cleavage and did not show any crystal outline or any additional cleavages. The mineral is biaxial, negative; mean index of refraction very high, birefringence high; acute bisectrix normal to the perfect cleavage; optic axial angle ($2V$) very small. The interference figure looks like that of muscovite and its behavior, when the stage is rotated, is the same. These properties show that the mineral is, beyond question, leadhillite.

Linarite has previously been found by Umpleby in the Dome District¹ so that the above is the second observed occurrence of the mineral in the state. Leadhillite has not previously been found in Idaho.

¹ Umpleby, J. B., "Lead-Silver Deposits of the Dome District, Idaho," *U. S. G. S. Bull.* 540 E, p. 59, 1913.

FLUORITE FROM MADOC, ONTARIO

T. L. WALKER

University of Toronto

At intervals for many years there has been a small production of fluorite from the vicinity of Madoc, Ontario. During the war some deposits have been developed into mines producing in all several thousand tons of fluorite per annum. The rock formation in the region around Madoc as indicated by Miller and Knight¹ consists of Precambrian (Keewatin, Grenville and Hastings), with intrusions of Moira granite, on which lies the Black River limestone. This whole series is cut by veins carrying fluorite, calcite and barite. Many years ago some of the veins were worked for barite, but during the last three years the mines have been worked for fluorite.

The object of this memorandum is to call attention to the optical and crystallographic properties of some very beautiful varieties of fluorite found at the Bradley mine, which is situated on the west half of lot 9 in the 14th concession of the township of Huntingdon, not far from Madoc.

The fluorite, which is commonly white, varies in color to green, blue, honey-yellow or rose. Sometimes the mineral appears as colorless crystals of brilliant luster which are very attractive as show specimens. This type seems to possess the characteristics of optical fluorite in color, freedom from cracks and inclusions, and in its breaking along fracture surfaces rather than along cleavage planes. The crystals are sometimes very large, some rough-surfaced crystals being almost 5 dm. in diameter. Where the crystals are embedded in barite or celestite the surfaces are smooth and brilliant, but where they are not so covered the crystal surfaces are usually rough, owing to the development of a multitude of smaller cubes approximately parallel to one another. Most of the crystals are interpenetration twins, as is usual for this mineral.

The forms observed on the crystals are the following:

octahedron, $p(111)$; rhombic dodecahedron, $d(110)$;
tetrahexahedron, $a(310)$; trisoctahedron, (441) ;
icositetrahedron, $n(322)$; cube, $c(100)$.

¹ Miller and Knight, *Ontario Bureau of Mines, 22d Report, part 2, 1913.*

The crystal habit and arrangement of forms present are shown in Fig. 1. The faces of the rhombic dodecahedron are always rough, while those of the cube are really very flat tetrahexahedra

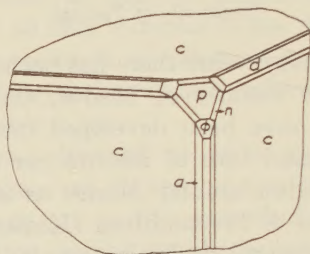


FIG. 1. Fluorite, Madoc, Ontario

and hexoctahedra. The cube faces are accordingly curved, especially when they are pierced by a corner of the second individual of a twin. The highest point of such a face is located at an angle of a projecting corner. The angles between the curved cube faces measured over the edges vary from $87^{\circ} 10'$ to $88^{\circ} 14'$. If that part of a cube face near the angle of a projecting corner be examined with the reflecting goniometer, using the small signal, a series of signals is seen, representing all the faces which combine to give rise to the pseudo-cube face. These small signals form an almost continuous series arranged more or less in the form of a circle. Each of the four quadrants of the composite figure contains a point representing a very flat tetrahexahedron and a great series of equally flat hexoctahedrons. The angle made by the flat tetrahexahedron with the cube face is $1^{\circ} 40'$, which is very close to the angle for the form: (35.1.0). The hexoctahedrons make with the cube face angles slightly less than this.

In the opinion of the writer, considering the brilliance, luster, perfection of crystallization and transparency of relatively large pieces this is probably the most beautiful fluorite known to science.

The American Museum of Natural History, New York City, has recently issued a 32-page Guide Leaflet (No. 49), entitled "The collection of minerals in the American Museum of Natural History," prepared by Herbert P. Whitlock, curator of mineralogy. It comprises a brief introduction to the science of mineralogy, notes on the history of the collection, the principles of mineral classification and nomenclature, and a guide to the collection, taken up group by group, with descriptive data on a few of the most important minerals in each. It is profusely illustrated with photographs of showy specimens in the collection.

AMBER AND ITS ORIGIN

GEORGE F. BLACK

New York Public Library

(Continued from page 85)

Thru repeated upheavals of the sea-bottom a broad belt of land was formed in the center of the enclosed sea which embraced the islands of Rügen and Bornholm, and extended over Jutland, the Danish islands, and the whole space now occupied by the Baltic. This newly-formed land was separated from Central Germany and the rest of Europe by a great sea-arm sometimes called the "North German Tertiary sea," one of whose bays or gulfs covered East and West Prussia and Pomerania. On the borders of this northern Atlantis, where the waters of the Baltic now roll, a rich and abundant vegetation was developed, and here, in the midst of luxuriant forests extending into the Polar area, grew the trees which produced our amber.

In early Tertiary times the climate of northern Europe, even within the Arctic circle, was subtropical or, at any rate, warm and equable, admitting the growth in the far north of mighty forests of bald cypress (*Taxodium*), the undoubted ancestors of the trees (*Taxodium distichum* Rich., sp.) which lend such a charm to the marshy lands of Louisiana, Texas, and Mexico. In Spitzbergen (78° N. Lat.) flourished the American incense cedar (*Libocedrus decurrens*) and the deep-green *Sequoia*, analogous to the gigantic redwood (*Sequoia sempervirens* Lamb.). This remarkable tree, which is now restricted to a narrow district of California, grew in the Miocene period all over Europe and the northern circumpolar area, together with its near relative, the bluish-green *Glyptostrobus*, a cypress now only met with in China and Japan (Heer, Primitive World of Switzerland, vol. 1, p. 325). In Greenland grew the large-leaved and fragrant magnolia, the date-palm tree, several species of oak, pine, poplar, and walnut, *Salisburia*, *Planera*, and the elegant *Thujopsis*—now indigenous only to eastern Asia—while the vine, the flowering tulip tree, the elm, and the mammoth redwood tree (*Sequoia gigantea* Lindl.) flourished in Iceland. It will have been observed from this enumeration that in the amber forest trees grew side by side whose living representatives are now scattered far and wide thru all climates from the tropics to far northern latitudes.

The amber forests, in which a wealth of species prevailed, such as never has been known since, consisted largely of coniferous trees. Professor Göppert distinguished thirty species of pine, to which Menge has added another, the *Taxoxylum electrochyton*. This great variety of resiniferous trees leads to the conclusion that amber is the product of not one but several species of extinct conifers; the most common being a "tree of life," closely resembling the American *Thuja occidentalis*, ten twigs of which, says Menge, occur in amber to one leaf or blossom of any leaf-bearing tree, and five to one of any other needle-leaved tree. Of leaf-bearing trees, preserved for us by the amber, may be mentioned several species of oak, willow, beech, a birch, an alder, and a poplar, as well as leaves and blossoms of the camphor tree (*Cinnamomum*), whose living congeners now grow in China, Japan, Formosa, and Cochin-China.

After leaving behind such opulent traces of former existence the amber forests have vanished—not one remains on the face of the earth. The trees have not only disappeared, but beyond the amber itself they have left few substantial indications of their former existence. True it is that in the blue earth of Samland we find along with the amber ligneous remains, but they are mostly fragments and small boughs. These fragments, which bear visible signs, like the amber itself, of having been rolled about by water, are such as lie about in every forest. That they belong to the amber forests is indubitable, for among them may be seen numerous small boughs of the amber-bearing trees, entirely filled with resin. In connection with all geological strata, we find accumulated the remains of the corresponding vegetation, and why do we not find the remains of the amber forests? The few fragments that have been found do not in the remotest degree represent the mass of wood they must have possessed in order to produce the quantities of resin we know to exist in the form of amber. Runge, in 1868, estimated that the forests yielded 100 million hundredweights of resin; a mass that would make a cube of which each side would measure about 160 meters, or roughly 5 million cubic meters of amber (Der Bernstein in Ostpreussen, p. 56). At present no satisfactory reason is forthcoming to explain the entire absence of substantial remains of these immense forests.

Practically every specimen of wood enclosed in amber displays the characteristic properties peculiar to conifers. Un-

fortunately this in itself is not sufficient to determine the species with certainty. Leaves and blossoms are also required, and a specimen of amber containing both the wood and leaves belonging to it has not yet been found. Hence the difficulty of deciding the question whether amber belongs to the genus *Pinus* or *Picea*. Göppert's designation, "*Pinites succinifer*," which leaves it indefinite whether it is a pine or a fir-tree, is, therefore, generally accepted. Göppert determined no less than 163 species of plants found in amber, which he classified into 64 genera and 24 families.

The amber resin appears to have been shed in very different stages of liquidity. Sometimes it was glutinous, sometimes it fell in drops from the branches, thus yielding the "drop" and "icicle" forms. These drops vary in size from that of a pea to that of a medium-sized orange. Others have dropped from the trees while in a more fluid state and are flattened out and show the impression caused by falling. Sometimes, again, the drop fell on leaves, the form of which it preserves with remarkable delicacy. From its abundance it is evident that the trees must have been as productive as the present day *Dammara australis* of New Zealand, the twigs and branches of which are so laden with white resin as to have the appearance of being covered with icicles. The largest known mass of amber is in the Museum in Berlin; it weighs over 8 kilograms and is said to be valued at \$30,000.

(To be continued)

NOTES AND NEWS

Mr. William F. Foshag, a recent graduate of the University of California, has been appointed assistant curator of the Division of Mineralogy and Petrology, U. S. National Museum.

Mr. Whitlock calls our attention to an error in his paper on "Pyrite crystals from Broadway and 207th Street, New York City," published in our April number. The form described as the trapezohedron (766) is really another form, its correct symbol being (655). A change should be made accordingly both in the text and in the table on page 31; and on page 32, in the third line of the table, in the angle column the same change should be made, while in the calculated angle column the value should be $49^{\circ} 41'$.

We take this occasion to remind subscribers whose subscriptions expired with the June number that we will greatly appreciate it if they will send in their renewals promptly, without waiting to receive bills.

REMINISCENCES OF WILLIAM E. HIDDEN

GEORGE F. KUNZ

New York City

The late William Earl Hidden was a very keen, observing and intelligent collector. His early training as designer for a bank-note company—a profession in which he was very proficient—was brought to a close when he was twenty-four years of age, thru lack of proper encouragement on the part of the company, and thru his own restlessness. He preferred to spend his time looking up mineral localities, in mining, in the collecting and selling of coins, etc. Had he remained at his bank-note designing, no doubt he would have attained eminence in that line. He attended the evening chemical lectures at the Cooper Union from 1873 to 1876. We were students together in the chemistry and physics departments of the Cooper Union.

Among the many mineralogical trips which we took together, one which we made to Kingsbridge on the Fourth of July, in the early part of our acquaintance, was notable for our discovering, in an old wall, a splendid, doubly-terminated crystal of tourmaline. We narrowly escaped arrest for damaging this wall!

Hidden was highly "temperamental," and preferred not to settle in business in any one place; this resulted in his being more or less unfortunate in a business way, but it gave him the opportunity to visit many localities and to secure fine mineral specimens, which would not otherwise have been obtained.

(To be continued.)

PROCEEDINGS OF SOCIETIES

THE NEW YORK MINERALOGICAL CLUB,

FRIDAY, MAY 23, 1919

The regular monthly meeting for May was held on the 23d at the American Museum of Natural History with the President, Dr. Kunz, presiding, and an attendance of 47 members and guests. The minutes of the last meeting were read and approved. Nominations for members being in order, the name of Mr. Ernest Weidhaus was presented by Mr. Manchester.

The question of an excursion for Decoration Day was introduced by the Chair. Mr. Schernikow suggested Montville, N. J., as a possible objective for the Decoration Day Excursion. Chimney Rock was suggested by Capt. Miller. After some discussion the matter was referred to the Committee on Excursions with power to act.

As bearing upon the paper announced for the evening Mr. J. P. Wintringham drew attention to the interference figure given by a variety of isomorphous mixed crystals of the tartrates of sodium and potassium with sodium and ammonium. He stated that one set of refractive indices gave $\alpha = 1.490$, $\beta = 1.491$ and $\gamma = 1.493$, corresponding to a very low double refraction, 0.003. These indices change very rapidly with the color; with red the optic plane is parallel to (010) and the optic angle has a value of $2E = 35^\circ$. On passing successively thru the spectrum this angle diminishes until $2E$ becomes zero for some color near yellow, giving to the interference figure a uniaxial aspect. On progressing further thru the spectrum, $2E$ again increases, but in a direction nearly at right angles to its former direction, that is, it is now parallel to (100); and at the blue end of the spectrum the value of $2E$ becomes 41° . This type of dispersion occurs in a few other rhombic crystals, but is not so distinct or so extensive as in this instance. Dr. Francis D. Dodge, who prepared the crystals, called attention to the fact that the directions of the two optic planes do not appear to be exactly at right angles, but about 5° from a right angle. Mr. Wintringham stated that this anomaly could hardly be explained by the assumption that the crystals were not accurately cut.

Biographical sketches of Dr. Carl Adolph Hintze, Sir William Crookes and Dr. Max Bauer were read by Dr. Kunz, who in addition to furnishing some highly interesting personal reminiscences of these recently deceased distinguished scientists, exhibited autographed copies of their works and autograph letters from them.

Dr. Kunz then introduced the speaker of the evening, Mr. A. McL. Nicolson, of the Research Laboratory of the Western Electric Co., who read a paper of great interest, originality and value, on: "Speaking Crystals, a development of the physical property, piezo-electricity."

In comparing piezo-electricity with the somewhat better known property, pyro-electricity, Mr. Nicolson gave a short history of the related phenomena, beginning with Haüy's experiments on calcite, and touching on the relation established by J. and P. Curie, between pyro- and piezo-electricity. He noted how electrification takes place when the pressure, which is brought to bear upon a crystal exhibiting the phenomenon, is changed, either increased or decreased. He showed that when electricity is impressed upon a crystal exhibiting piezo-electricity, a deformation takes place in the atomic structure.

Mr. Nicolson then briefly traced the experimental work of the Research Laboratory of the Western Electric Co. in relation to piezo-electric phenomena and showed how, starting with the historic experiments upon quartz and tourmaline, the Laboratory had extended their work to include crystals of certain artificial salts. It was necessary, in as much as the phenomena are confined to crystals belonging to rather unsymmetrical classes, to choose artificial salts producing crystals of this type. In this connection the tartrate of sodium and potassium, known as rochelle salt, produced by far the best results. Mr. Nicolson then described the production of these crystals from a nucleus or seed crystal grown by the application of a rapid temperature gradient. He stated that it was necessary to desiccate the crystals by immersing them in alcohol, and brought out the very interesting fact that in the desiccated crystal there is a re-distribution of the electrical charges. The

hour-glass structure of the large rochelle salt crystals has great significance in the electrical disposition of the charges induced by the stress applied. He also discussed at length the electrical charge developed by torsional strain.

After exhibiting a number of diagrammatic lantern slides illustrating the foregoing principles, Mr. Nicolson proceeded to demonstrate the electric properties of rochelle salt crystals subjected to a pressure of about 10 kg. per square cm. When such a crystal was attached to a phonograph needle, the vibrations of the needle, caused by the record, set up piezo-electric impulses, which were readily transmitted thru some 80 pairs of individual telephonic receivers, distributed thruout the audience. The reproduction of various sorts of phonograph records was of exceptional quality.

The electrical effect of torsional stress upon crystals was further demonstrated by a rochelle salt crystal surrounded by diagonally corrugated wrappings. This, used as a telephonic transmitter reproduced the conversations of Mr. Nicolson in an adjoining room in a most striking manner.

At the close of the demonstration a vote of thanks was tendered to Mr. Nicolson for his remarkably interesting paper and also to Mr. R. M. Allen for introducing him to the Club and thus procuring the privilege of the presentation of this unusual and striking demonstration.

After a short discussion the meeting adjourned at 9.30.

HERBERT P. WHITLOCK, *Recording Secretary.*

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, June 12, 1919

A stated meeting of The Philadelphia Mineralogical Society was held on the above date with the president, Dr. Leffmann, and later the vice-president, Mr. Trudell, in the chair. Eighteen members and sixteen visitors were present.

Dr. Harry A. Keller addressed the society on "The Platinum Metals." The members of the group were characterized, introductory to a general history of their discovery, and occurrences. Deposits in Colombia and Perm were described. The talk was illustrated with a number of lantern slides of specimens and maps of the localities. The paper was discussed by Messrs. Leffmann and Koch. A vote of thanks was tendered to the speaker.

Mr. Gordon reported the society's excursion to East Bradford township, Cope's Mill and Cope's quarry in Chester County, attended by Messrs. Oldach, Knabe, Frankenfield, and Gordon. No specimens were found.

Messrs. Knabe and Hagey presented an account of the May 30, 31, June 1 excursion to Phoenixville, Robeson, Trap Rock, and Falls of French Creek, attended by Messrs. Hagey, Knabe and Gordon. At Phoenixville, fine cerussite crystals, pyromorphite, wulfenite, anglesite, sphalerite, and galena (argentiferous) were found; at Robeson, stilbite, apophyllite, chabazite, and natrolite; at French Creek, fine groups of pyrite and apophyllite. Mr. Hagey exhibited lantern slides taken on the trip to supplement the specimens shown. Mr. Bengé exhibited quartz crystals from Henderson.

On motion the society adjourned until September 11.

SAMUEL G. GORDON, *Secretary.*

NEW MINERALS

CHUBUTITE

Hercules Corti: Chubutite, a new lead mineral. *Anales soc. quim. Argentina*, **6**, 65-72, 1918; thru *Chem. Abstr.*, **13** (4), 298, 1919.

NAME: From the locality, Chubut, Argentina.

PHYSICAL PROPERTIES

Color: yellow, sometimes reddish or greenish; structure, lamellar; H. = 2.5; brittle; D. = 7.952.

OPTICAL PROPERTIES

Under the microscope greenish yellow, with n "not high" and birefringence slight. Crystal system indicated to be tetragonal.

CHEMICAL PROPERTIES

Essentially $7\text{PbO} \cdot \text{PbCl}_2$, analysis showing: PbO 83.30 and PbCl_2 14.83 per cent., with minor amounts of SiO_2 , Al_2O_3 , Fe_2O_3 and Sb_2O_3 . Similar material was made by fusing the constituents together in these proportions. Insoluble in water, but readily soluble in dilute HNO_3 and in hot 30 per cent. KOH solution.

(The above features suggest that this mineral is practically the same as loretoite of Wells and Larsen, *J. Wash. Acad. Sci.*, **6** (20), 669-672, 1916; *Am. Min.*, **2** (2), 26, 1917. See: Chubutite, E. Rimann, *Anales soc. quim Argentina*, **6**, 323-328, 1918; *Chem. Abstr.*)

E. T. W.

ABSTRACTS OF MINERALOGIC LITERATURE

BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY FOR 1917. WITH SUBJECT INDEX. JOHN M. NICKLES. *U. S. Geol. Survey Bull.*, **684**, 154 pp., 1918.

Includes many articles on mineralogy.

E. T. W.

THE NATURE OF THE WATER OF ZEOLITES. GEORG STOKLOSSA. *Dissertation, Univ. Breslau*, 1917, 64 pp.; thru *J. Chem. Soc.*, **114**, ii, 122, 1918.

From studies made of heulandite, scolecite, natrolite, harmotome, chabazite, analcite, and apophyllite, it is concluded that the water in all of them is chemically combined.

E. T. W.

CRYSTAL STRUCTURE OF THE ALUMS AND THE RÔLE OF THE WATER OF CRYSTALLIZATION. L. VEGARD AND H. SCHJELDERUP. *Ann. Physik*, **54**, 146-164, 1918; thru *Science Abstracts*, **21-A**, 266, 1918.

X-ray measurements on the alums are described. The structures derived are too complicated for brief abstracting.

E. T. W.

A PEGMATITE ORIGIN FOR MOLYBDENITE ORES. E. THOMSON. *Econ. Geol.*, **13**, 302-313, 1918.

Study of several deposits in Quebec shows that the molybdenite always occurs in or near pegmatite dikes, or in rocks formed by pneumatolytic action.

E. T. W.

MOLECULAR DESTRUCTION OF KAOLINITE BY HEAT. A. M. SOKOLOV. *Z. Kryst. Min.*, **55**, 195-196, 1917; thru *J. Chem. Soc.*, **112**, ii, 492, 1917.

From determinations of the water lost at different temperatures and the amounts of silica and alumina extractable from the residues it is concluded that the kaolinite molecule is broken down into its constituent oxides at 800°.

E. T. W.

ZIRCONIA AS A REFRACTORY. E. H. RODD. *J. Soc. Chem. Ind.*, **37**, 213-215, R, 1918.

This article includes data on the occurrence of the rock zirkite (erroneously called a mineral), noting that it contains 3 minerals, "brazilite," zircon, and an unknown silicate of zirconium. Refers to Meyer, *Wileman's Brazilian Review*, 1916, p. 826.

E. T. W.

THE MICROSTRUCTURE OF CERTAIN TITANIC IRON ORES. CHARLES H. WARREN. *Econ. Geol.*, **13**, 419-446, 1918.

From metallographic studies of titaniferous iron oxide minerals it is concluded that there is partial solid solution between magnetite and ilmenite, and complete solid solution between hematite and ilmenite. In some cases also rutile appears to enter into solid solution as such.

E. T. W.

CHEMICAL STUDY OF A TITANIUM MINERAL FROM THE SIERRA DEL PIE DE PALO, SAN JUAN. LUCIANO R. CATALANO. *Anales soc. quim. Argentina*, **6**, 35-48, 83-93, 1918; thru *Chem. Abstr.*, **13** (4), 298, 1919.

Analytical data given for this mineral indicate it to be a variety of ilmenite.

E. T. W.

LEUCITE PSEUDOMORPHOUS AFTER NEPHELITE FROM PARCO CHIGI, ALBANIA. F. ZAMBONINI. *Atti accad. sci. Torino*, **8**, 445-450, 1918; thru *Chem. Abstr.*, **12** (23), 2509, 1918.

Some crystals of nephelite in a rock were found to be altered superficially and in cavities to minute leucite crystals. Some sanidine was admixed, and the material is thought to be the result of the action of solutions containing K_2SiO_3 on nephelite at moderately high temperatures.

E. T. W.

NOTES ON THE FORMATION OF CERTAIN ROCK-FORMING MINERALS IN AND ABOUT GLASS FURNACES. G. V. WILSON. *J. Soc. Glass Techn.*, **2**, 177-216, 1918; thru *Chem. Abstr.*, **13** (2), 173-174, 1919.

An elaborate account of the conditions of formation of wollastonite, augite, tridymite, quartz, feldspar, magnetite, biotite, melilite, corundum, and sillimanite.

E. T. W.

THE CALCULATION OF THE "RATIONAL ANALYSIS OF CLAYS." HENRY S. WASHINGTON. *J. Am. Ceram. Soc.*, **1**, 405-421, 1918.

It is pointed out that the results obtained by treating clays with strong reagents are practically impossible to interpret correctly, and the method used with igneous rocks, of making an accurate ultimate analysis and calculating norms, is preferable.

E. T. W.

NOTE ON A PHOSPHORESCENT CALCITE. E. L. NICHOLS AND H. L. HOWES. *Phys. Rev.*, **11**, 327, 1918.

A record of observations on calcite from Franklin Furnace, N. J. It shows a red-yellow phosphorescence of short duration, and the rate of decay of the phosphorescence and the spectrum of the light are described.

E. T. W.

THE PHOTOLUMINESCENCE AND CATHODOLUMINESCENCE OF CALCITE. E. L. NICHOLS, H. L. HOWES, and D. T. WILBER. *Phys. Rev.*, **12**, 351-367, 1918.

The red luminescence of Franklin Furnace calcite appears to be due to the presence of limited amounts of manganese. By adding a salt of this element to pure calcium carbonate and heating, material showing similar effects could be prepared. The physical features of the luminescence are described at length.

E. T. W.

THE CRYSTALLOGRAPHY AND NOMENCLATURE OF HOLLANDITE. L. LEIGH FERMOR. *Rec. Geol. Survey India*, **48**, 103-120, 1917; abstract reprinted by permission from *Chem. Abstr.*, **13** (2), 105, 1919.

Hollandite crystals up to 2 inches (5 cm.) long from the Kajlidongri mine, Jhabua State, Central India, were examined and found to be tetragonal-pyramidal; $c = 0.2039$, with the principal forms m (110), a (100), k (210), p (111) and q (331), and about 57 more or less indefinite forms. Hollandite is considered to be a crystalline form of psilomelane, and a manganate corresponding to the formula H_4MnO_8 , probably a member of the scheelite group. Romanéchite of Lacroix and possibly coronadite are identical with hollandite. Fermor suggests that the letter X be prefixed to indicate crystalline phases of amorphous minerals, and the prefix κ to indicate colloidal phases of crystalline minerals.

S. G. G.

THE NUMERICAL RELATIONS BETWEEN THE E_t CURVE AND THE E_λ CURVE OF THE EIFEL SANIDINE. S. Kôzû. *J. Geol. Soc. Tokyo*, **25**, 43-45, 1918.

S. G. G.

THE DETERMINATION OF THE LIMITING VALUES OF THE MEDIUM REFRACTIVE INDEX OF A FINELY CRUSHED BIAXIAL CRYSTAL BY THE IMMERSION METHOD. SEITARO TSUBOI. *J. Geol. Soc. Tokyo*, **35**, 38-41, 1918.

The value of index β being always between the two observed on any grain, it is possible to determine it approximately by immersing successively in liquids with indexes differing by 0.003 and observing the relations of the indexes of the grains with that of each liquid on a considerable number of grains.

S. G. G.

SPOTTED LAKES OF EPSOMITE IN WASHINGTON AND BRITISH COLUMBIA. OLAF P. JENKINS. *Am. J. Sci.* [4], **46**, 638-644, 1918.

Epsomite and thenardite occur in lakes on Kruger mountain. These salts are thought to have formed by the action of sulfuric acid from decomposing pyrite in adjacent rocks on other rocks containing Mg, Ca, and Na.

E. T. W.

THE PROBABLE IDENTITY OF PEGANITE WITH VARISCITE. LORENZO MOSCHETTI. *Atti reale accad. sci. Torino*, **53**, 1062-1066, 1917-1918.

A specimen of alleged peganite was analyzed and found to have the composition $\text{AlPO}_4 \cdot 2\text{H}_2\text{O}$, and because of this and other features it is suggested that peganite is nothing but variscite. [Not the slightest optical or crystallographic data are given, so little weight can be attached to this conclusion. Abstr.] E. T. W.

THE BARITE DEPOSITS OF MISSOURI. WILLIAM A. TARR. *Univ. Missouri Studies*, **3**, 111 pp., 1918.

A detailed description of the mineral association, occurrence, origin, etc., of the barite. S. G. G.

A GRAPHIC INTERGROWTH OF DIOPSIDE AND ILMENITE FROM THE BEMBESI DIAMOND FIELD, SOUTHERN RHODESIA. A. M. MACGREGOR. *Trans. Geol. Soc. S. Africa*, **18**, 1-4, 1916.

The composition and origin of the material are discussed. S. G. G.

THE OCCURRENCE OF RADIOACTIVE MINERALS IN SOUTH AFRICA. A. W. ROGERS. *Trans. Geol. Soc. S. Africa*, **18**, 5-10, 1916; abstract reprinted by permission from *Chem. Abstr.*, **13** (7), 692, 1919.

Monazite, euxenite and fergusonite occur in gravels, with cassiterite, corundum, scheelite, magnetite, and garnet, in Embabaan Swaziland, supposedly derived from the gneissic rocks of the region. Euxenite occurs in pegmatites at Kenhardt. Tantalite and columbite occur in lumps and crystals (one group weighed 16 pounds (7 kg.)) in pegmatite with feldspars, quartz, muscovite, lepidolite, garnet, beryl, and spodumene in Little Namaqualand. Analyses of euxenite, columbite, and tantalite are given. S. G. G.

DESCRIPTION OF A CARBONACEOUS MINERAL OCCURRING IN THE WITKOP MINE, NEAR ZEERUST, TRANSVAAL. C. ANDERSON. *Trans. Geol. Soc. S. Africa*, **18**, 129-131, 1916.

The properties and compositions of specimens consisting of anthraxolite and schungite are described. S. G. G.

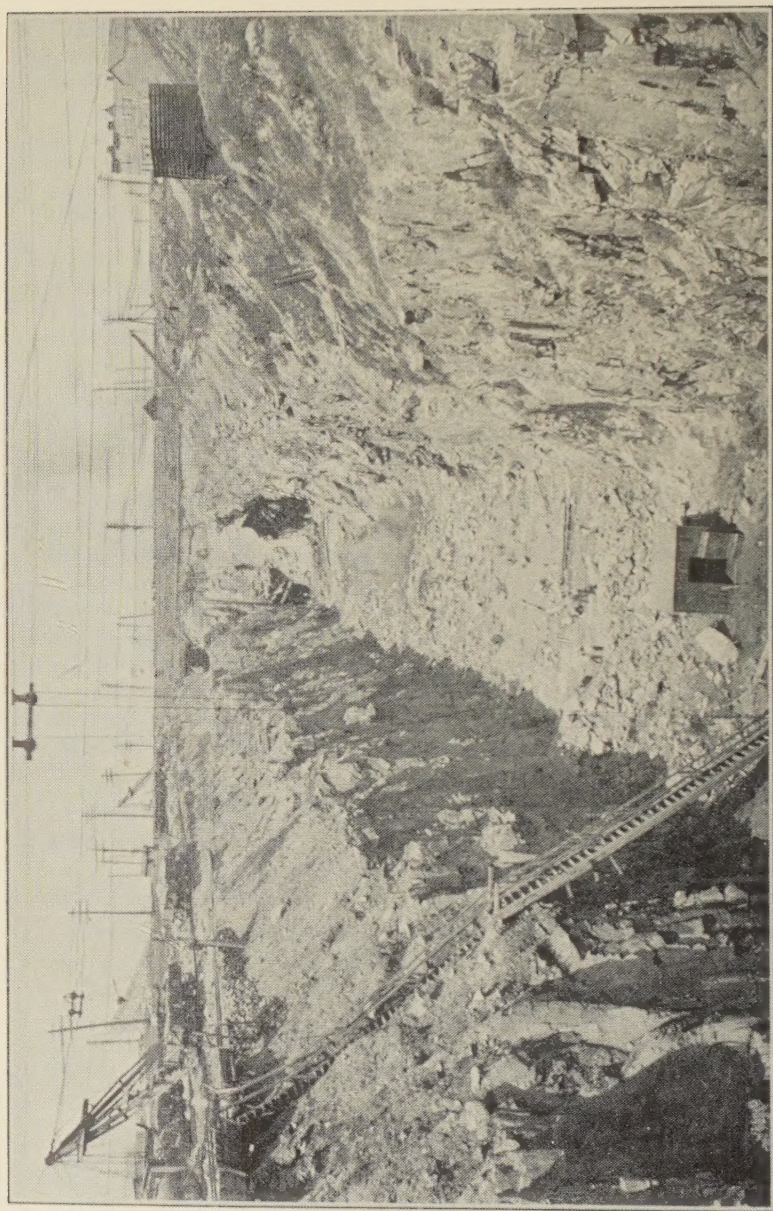
NOTES ON THE GEOLOGY OF RHODE ISLAND. A. C. HAWKINS. *Am. J. Sci.* [4], **46**, 437-472, 1918.

The occurrence of orthoclase, epidote, calcite, wernerite, actinolite, and apatite are noted, developed by contact metamorphism at Manton and South Foster. Tiny brilliant white crystals of apatite on biotite showed the forms: o (0001), s (1121), y (2021), x (1011), r (1012), z (3031), a (1010) and (6.6.12.1). S. G. G.

A NEW SYNTHESIS OF PHOSGENITE. W. A. HAMOR AND H. E. GILL. *Am. J. Sci.* [4], **47** (6), 430, 1919.

Lead hydroxide and phosgene in excess under pressure were heated in a sealed tube at a number of temperatures from 95° to 250° C., from 1 to 4 hours. The best results were obtained at 175°. The phosgenite crystals were small, but well defined. S. G. G.

PLATE 10.



THE BERGEN ARCHWAYS
(A view of Cut No. 4 during construction)